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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,624	04/22/2004	Gino Georges Lavoie	71632	7402

7590 10/04/2005

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EXAMINER

OH, TAYLOR V

ART UNIT	PAPER NUMBER
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1625

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/743,624	Applicant(s) LAVOIE, GINO GEORGES	
	Examiner Taylor Victor Oh	Art Unit 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/22/03</u> . | 6) <input type="checkbox"/> Other: _____ |

[Handwritten mark]

The Status of Claims

Claims 1-21 are pending.

Claims 1-21 have been rejected.

DETAILED ACTION

1. Claims 1-21 are under consideration in this Office Action.

Priority

2. None.

Drawings

3. The drawing filed on 4/22/2004 is accepted by the Examiner.

Election/Restrictions

Applicant's election without traverse of Group I (claims 1-21) on 8/29/05 is acknowledged.

Claims 22-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group II which has been canceled, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1 , the phrases “substantially free of ” and “ incompletely oxidized reaction products comprising 4- carboxybenzaldehyde compounds ” are recited. They are vague and indefinite because the expression of the term “comprising” would mean that there are other additional components besides the only compound and the phrase “substantially free ” does not elaborate what is meant by the phrase “substantially free ”.

Also, there is uncertainty as to the term “comprising” used in the expression of the definite compound. Furthermore, the term “ comprising” is an open language without a limit in the claim; the expression do not exclude the presence of other ingredients than the one or ones recited. Exparte Muench , 79 USPQ 92 (PTO BD. APP. 1948) and Swain V. Crittendon , 332 F 2d 820 , 141 USPQ 811 (C.C.P.A 1964). Therefore, an appropriate correction is required.

Claim Rejections - 35 USC § 102

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-14 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Partenheimer et al (US 4,786,753).

Partenheimer et al discloses a method of producing terephthalic acid by oxidizing p-xylene in the presence of a catalyst composition comprising 2.01 mmol of Ni, 2.01 mmol of Mn, and 2.01 mmol of bromine (see col. 5 ,lines 15-38) at a pressure of 150 psig and at a temperature of 160⁰ C (see col. 2 ,lines 65-66). This is identical with the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Partenheimer et al (US 4,786,753) in view of Vynne Noval et al (EP 0041784) .

Partenheimer et al discloses a method of producing terephthalic acid by oxidizing 70-80 % (see col. 2 ,line 43) of p-xylene in the presence of a catalyst composition comprising 2.01 mmol of Ni, 2.01 mmol of Mn, and 2.01 mmol of bromine (see col. 5 ,lines 15-38) at a pressure of 150 psig and at a temperature of 160⁰ C (see col. 2 ,lines 65-66). Furthermore, the resulting gases in the reactor have been sent to oxygen and CO₂ analyzers to measure the extent of reaction and degree of burning as shown in the table III (see col. 6 table III).

However, the instant invention differs from the prior art in that the claimed 4-CBA content in solids is 10,000 ppm or less; the claimed ratio of solvent burn is 0.8 moles CO_x per mole of terephthalic acid or less.

Vynne Noval et al (EP 0041784) teaches that a crude terephthalic acid is obtained by oxidizing p-xylene in a liquid phase oxidation in the presence of heavy metal catalysts in the following examples (see page 3 ,line 30 to page 4 ,line 24):

54 g p-toluic acid was charged to the autoclave along with 1800 ml water, 9.2 ml of 47% w/w aqueous HBr and various amounts of cobalt dibromide hexahydrate, manganese dibromide tetrahydrate and nickel dibromide trihydrate to give the metal concentrations indicated in the table. The reaction mixture was then heated under a nitrogen atmosphere to 215°C and a total pressure of 34.5 bar. A mixture of 30% oxygen in nitrogen was then passed through the autoclave at a total flow rate of about 700 l per hour (measured at STP). After 30 minutes oxidation, a small sample of the reaction mixture was removed from the autoclave. The oxidation was continued for a further 30 minutes and another sample of reaction mixture removed from the autoclave. The samples of reaction mixture were cooled to ambient temperature and the product filtered, washed with water and dried. The dried products were analysed and found to contain the 4-carboxybenzaldehyde (4CBA) levels given in the table.

Example No.	Catalyst Metal Levels in Mother Liquor			4CBA Content of TA Product	
	Mn (ppm)	Co (ppm)	Ni (ppm)	After 30 min oxidation (wt. %)	After 60 min oxidation (wt. %)
1	1063	188	0	0.62	0.25
2	1000	250	0	1.5	0.62
3	625	625	0	3.7	1.5
4	1125	0	125	0.78	0.41
5	938	0	312	1.0	0.85
6	625	0	625	3.0	1.5
7	1250	0	0	3.6	
8	0	1250	0	2.6	
9	0	0	1250	6.4	

Concerning the claimed ratio of solvent burn, the prior art is silent about the ratio. However, Partenheimer et al does teach guidance that the resulting gases in the reactor can be sent to oxygen and CO₂ analyzers to measure the extent of reaction and degree of burning (see col. 5 ,lines 60-62) as shown in the table III (see col. 6 table III). Therefore, it would have been obvious to the skilled artisan in the art to obtain the claimed ratios by using the trial and error process as shown in the guidance(see col. 5 ,lines 60-62).

Partenheimer et al expressly teaches the method of producing terephthalic acid by oxidizing p-xylene in the presence of a catalyst composition comprising Ni, Mn, and

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bromine at a pressure of 150 psig and at a temperature of 160⁰ C. Similarly, Vynne Noval et al does teach that it is possible to control the content of 4-CBA of the crude terephthalic acid obtained by oxidizing p-xylene in a liquid phase oxidation in the presence of heavy metal catalysts. Both are involved in the process of producing terephthalic acid. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the teaching of the Vynne Noval et al with respect to adjusting the content of 4-CBA into the Partenheimer et al process in order to control selectivity in a chemical process. This is because the skilled artisan in the art would expect such a modification to be successful and effective to control the purity of the final terephthalic acid applicable for manufacture of polyester as shown in the abstract of Partenheimer et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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